this point. The reactions here are complex, as certain hydrocarbons dissociate in the checkers, as well as $C0_2$. A further increment of moisture occurs in certain elements of the charge, and an open-hearth furnace is not particularly efficient as a dryer. At the same time, moisture is carried in by the air supply. All of this water leaves the regenerator for the stack as highly super-

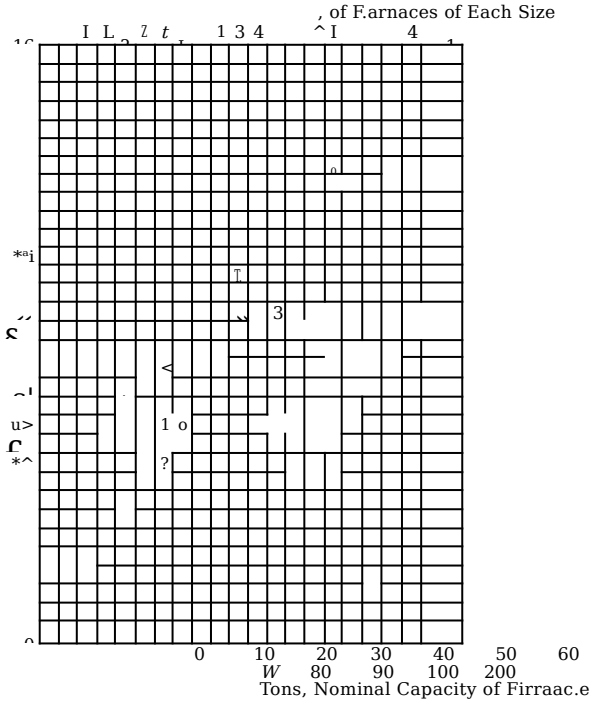

FIG. 161.—Graphical Comparison of Air Valve Areas of Various Open-hearth Furnaces.

heated steam, and its amount is considerable, particularly with large furnaces. In " The Heat Balance of the Open-Hearth/' by Sidney Cornell *(Chemical and Metallurgical Engineering,* May, 1913), the weight of moisture passing in the flue gases was given as about 26 per cent of the weight of ingots produced. The water seals in the valves increased the amount of moisture in the producer gas 1 per cent.

The water seal depends upon its water supply, and a very slight